



## Invasive processes, mosaics and the structure of helminth parasite faunas

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### Abstract:

The biosphere in evolutionary and ecological time has been structured by episodes of geographic and host colonisation that have determined distributions of complex assemblages of microparasites and macroparasites, including helminths circulating among vertebrates. Biological invasion is an intricate phenomenon often involving 'extra-range dispersal' and establishment of exotic (non-indigenous) species and populations substantially beyond their native range. Invasion may also involve the expansion or shifting of host and geographic distributions of an endemic (indigenous) species or fauna under changing environmental conditions. Invasions result in faunal interchange occurring under influences from both natural and anthropogenic forces where expansion on spatial/temporal continua bridges continents, regions and landscapes. Drivers for invasion are idiosyncratic, multifactorial, interactive, and opportunistic, with a powerful role for historical contingency. The life history patterns of helminths interact with invasion pathways to determine the potential for introduction. Human-mediated events, such as the global expansion of pathogens linked to development of agriculture, domestication of food animals, and European exploration have had a pervasive influence on the distribution of helminths. Globalisation, broad transport networks and environmental perturbation linked to climate change, along with other drivers, have accelerated these processes. A consequence of invasion and establishment of exotic species is that faunal structure will be a mosaic that includes admixtures of indigenous and non-indigenous species and populations; exemplified by helminth faunas among domestic and free-ranging ungulates and a diversity of host-parasite systems among vertebrates. Contemporary mosaics are evident where human-mediated events have brought assemblages of new invaders and relatively old endemic species into sympatry, highlighting interactions at ecotones, particularly those at borderlands between managed and natural ecosystems. Understanding the historical origins and complex components of mosaics is essential in formulating predictions about future responses to environmental change. Powerful tools are available which support the study of invasive species, the most important being systematics and our capacity to accurately identify parasites and to define evolutionary and biogeographic history. Faunal baselines derived from arrays of biological specimens, integrated surveys and informatics are a permanent record of the biosphere when archived in museum collections. The absence of comprehensive taxonomic inventories of parasites, including molecular-genetic data, limits our ability to recognise the introduction of non-indigenous parasites, and to document patterns of expansion for local faunas under a regime of environmental perturbation.

**Source:** [http://web.oie.int/boutique/index.php?page=Euro Surveillance \(Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin\)ficprod&id\\_prec=Euro Surveillance \(Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin\)812&id\\_produit=Euro Surveillance \(Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin\)982&lang=Euro Surveillance \(Bulletin European Sur Les Maladies Transmissibles; European](http://web.oie.int/boutique/index.php?page=Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)ficprod&id_prec=Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)812&id_produit=Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)982&lang=Euro Surveillance (Bulletin European Sur Les Maladies Transmissibles; European)

[Communicable Disease Bulletin](#)) en & fiches recherche Euro Surveillance (Bulletin Européen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)1

## Resource Description

### Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Human Conflict/Displacement, Temperature

### Temperature: Fluctuations

### Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

### Geographic Location:

resource focuses on specific location

Global or Unspecified

### Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

### Infectious Disease: Foodborne/Waterborne Disease

#### Foodborne/Waterborne Disease: Helminthiases

### Resource Type:

format or standard characteristic of resource

Research Article, Review

### Timescale:

time period studied

Time Scale Unspecified